Geriatrics, Palliative Care and Interprofessional Teamwork Curriculum

Module # 10 : Geriatric Syndromes

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I. Overview: Geriatricians use the phrase "geriatric syndrome" to describe the unique features of common health conditions in older people that do not fit into discrete disease categories. These conditions include delirium, falls, incontinence, and frailty. Geriatric syndromes share many common features. They are highly prevalent in older adults, especially frail older people. Their effect on quality of life and disability is substantial. Multiple underlying factors, involving multiple organ systems, tend to contribute to geriatric syndromes. Frequently the primary symptom is not related to the specific pathological condition underlying the change in health status. For example, when an infection involving the urinary tract causes delirium, it is the altered neural function in the form of cognitive and behavioral changes that permits the diagnosis of delirium and determines many functional outcomes. Because these syndromes cross organ systems and transcend discipline-based boundaries, they challenge traditional ways of planning and delivering clinical care.

II. Learning Objectives

1. Describe the prevalence and risk factors associated with falls, gait abnormalities, incontinence, sleep disorders and pressure ulcers in the elderly.

2. Identify the components of evaluation for the above conditions: history and physical examination.

3. Discuss interventions for the above conditions in the elderly.

III. Falls

A. Demographics[1, 2]

1. Falls are the leading cause of accidental death in older adults.

2. Of the fall-related deaths in the US, 70% occur among older adults.

3. In the elderly population, 1 out of every 7 falls results in a fracture.

4. For older adults over the age of 75, who fracture a hip as a result of a fall, half will die within one year of the incident.

5. About one-third of older persons over the age of 65 years living in the community fall each year. The risk for falls increases as the person ages to about 50% of those 80 years and over each year. About 67% of nursing home residents fall each year.

6. Acute care costs related to fractures from falls is estimated at $10 billion annually.

7. An estimated 40% of nursing home admissions are related to falls and instability.

B. Risk Factors

- ♦Cognitive impairment
- ♦Medication
- ♦Impaired mobility / gait / balance
- ♦Fall history
- ♦Acute or chronic illness
- ♦Elimination problems
- ♦Environmental factors
- ♦Sensory deficits
- ♦Alcohol use
- ♦Postural hypotension
- ♦Depression
- ♦Use of assistive devices
- ♦Frailty / deconditioning
- ♦Fear of Falling

C. Risk Factors for Serious Fall Injury[3]

- Older age
- White race
- Decreased bone mineral density
- Decreased body mass index
- Cognitive impairment

D. Protective Factors Against Injury of Fracture[4]

- Estrogen therapy
- Weight gain after age 25
- Walking for exercise
- Adequate dietary calcium intake

E. Evaluation of a Fall[5]

1. History

   a. Activity at the time of the fall
   b. Premonitary symptoms: light-headedness, palpitations, dyspnea, chest pain, vertigo, confusion, incontinence, loss of consciousness, tongue biting
   c Location of fall
   d. Witnesses to fall
   e. History of previous falls (of same or different character); history of falls may be difficult to elicit
   f. Past medical history
   g. Medications

2. Physical examination

   a. Visual acuity
   b. Cardiovascular system: blood pressure, pulse (supine and standing), arrhythmia, murmur, bruits
   c. Extremities: arthritis, edema, podiatric problems, poorly fitting shoes, ROM strength
   d. Neurologic system: mental status testing, gait and balance assessment, i.e. the timed "up and go" (patient rises from an arm chair, walks 3 meters, and returns to chair—see scoring tables[6]), walking, bending, turning, reaching, ascending and descending stairs, standing with eyes closed
   e. (Romberg test), sternal push
   f. Injuries
   g. Use of assistive devices

F. Interventions for Fall Prevention and Minimizing Injury[1]
(See Table "Treatment of Identified Risk Factors for Fall Injury"[4])

1. Intrinsic Factors

   a. Review medication regimen (benzodiazepines and drugs causing orthostatic hypotension should be carefully evaluated)
   b. Assess alcohol use (may be difficult to get accurate history)
   c. Assess cognitive abilities
   d. Assess patient mood state (especially for depression)

e. Provide and maintain assistive devices for sensory deficits (eyeglasses, hearing aids)
f. Increase strength of the older adult
g. Evaluate gait and balance – provide restorative therapy/exercises
h. Assess client use of assistive devices for ambulation (hand rails, canes, walkers)
i. Evaluate continence needs and establish toileting schedule as appropriate
j. Assess patient's understanding of fall risk and prevention strategies
k. Assess caregiver/surrogate's understanding of fall risk and prevention strategies

2. Extrinsic Factors

a. Evaluate environment (lighting, loose rugs, slippery or uneven flooring, exposed cords)
b. Evaluate client footwear (stable, proper fitting)
c. Utilize bed-exit alarms as appropriate
d. Shower and toilet grab bars
e. Elevated toilet seats
f. Put frequently used items on lower shelves in home, use grabbing devices
g. Remove clutter

G. Case Analysis: Mr. and Mrs. C's home:

Mr. and Mrs. C live in a single-family home in the suburbs. Both of them are in their 80s. They have a son and daughter who live within driving distance and visit every week. Mrs. C has osteoarthritis and ambulates with a cane. Mr. C has mild Parkinson's disease and walks with a mild shuffle.

They have been living in their home for 36 years and in the last 5 years they have not made any repairs. The front stairs are slightly broken and there is no outdoor lighting. Their bathroom is very old with a bathtub, no shower and an old sink and toilet.

They like to have throw rugs throughout the house for their two cats to sleep on. Mrs. C had a fall recently with minimal bruising. She stated at the time, "My cataracts are getting worse," but has no plans for surgery.

Both take multiple medications and occasionally will "swap" medications for similar complaints. Mr. C has begun using Mrs. C's glasses because his own are broken. Both have moderate hearing loss but state that it has not adversely affected their lifestyle.

[*] Mariano C, Gould E, Mezey M, Fulmer T, eds. Best Nursing Practices in Care for Older Adults: Incorporating Essential Gerontologic Content into Baccalaureate Nursing Education. 2nd ed. New York: The John A. Hartford Foundation Institute for Geriatric Nursing, Division of Nursing, School of Education, New York University; 1999, Topic 12, p9.

IV. Gait Abnormalities

A. Demographics[7]

1. From 8-19% of non-institutionalized older adults have difficulty walking or require the assistance of another person or special equipment to walk.

2. In older adults 85 and older, the incidence of gait abnormality can be as high as 40% in non-institutionalized patients and 60% in nursing-home residents.

B. Evaluation[7]

1. Disordered gait is not an inevitable consequence of aging, but rather a reflection of the increased prevalence and severity of age-associated diseases.

2. The presence of slowed gait speed or deviations in smoothness, symmetry, or synchrony of body movement may indicate that gait is disordered. However, they also may provide the older adult with a safer, independent gait pattern.

3. See the included chart "Gait Disorders Classified by Sensorimotor Level" for the major contributors to abnormal gait. It is likely for more than one disease or impairment to act as a contributor.

4. Standardized assessment tools

   - See the "Tinetti Balance and Gait Evaluation," included in this Module.

   - See the "Performance-Oriented Mobility Assessment (POMA)" in Module 5: Geriatric Assessment.

C. Treatment[7]

1. The management of gait abnormality includes improvement in functional ability and treatment of specific diseases, however many conditions causing a gait abnormality are only partly treatable.

2. Substantial improvement occurs in the medical treatment of disorders secondary to vitamin B12 and folate deficiency, thyroid disease, knee osteoarthritis, Parkinson's disease and inflammatory polyneuropathy.

3. Moderate improvement, but with residual disability, can occur after surgical treatment for cervical myelopathy, lumbar stenosis, and normal-pressure hydrocephalus.

V. Urinary Incontinence

A. Definition – an involuntary loss of urine that is objectively demonstrable and leads to a social or hygienic problem[8]

B. Demographics [1, 8, 9]

1. According to the National Institutes of Health (NIH) Consensus Conference, less than half of people with symptoms of incontinence seek treatment.

2. Approximately 15-30% of non-institutionalized older persons are affected by urinary incontinence, including 19% of men and 39% of women. In nursing facilities, 50-70% experience urinary incontinence with 30% of this population also experiencing fecal incontinence.

3. It is about twice as prevalent in older women as in older men

4. Direct costs of urinary incontinence in community-dwelling older adults are estimated to be over $7 billion annually and $3.3 billion in long-term care nursing facilities.

C. Risk Factors

- ♦ Immobility
- ♦ Impaired cognition
- ♦ Medications
- ♦ High-impact physical activities
- ♦ Environmental barriers
- ♦ Diabetes
- ♦ Stroke
- ♦ Estrogen depletion
- ♦ Pelvic muscle weakness
- ♦ Childhood nocturnal enuresis

D. Transient Incontinence

1. DRIP
   D – Delirium
   R – (Urinary) Retention or restricted mobility
   I – (Fecal) Impaction
   P – Polyuria and pharmaceuticals

E. Established Incontinence[8]

1. Urge Incontinence: associated with a strong urge to void. Caused by an overactive detrusor muscle causing excessive involuntary bladder contraction, associated with various neurological conditions including stroke, spinal cord lesions and multiple sclerosis.

2. Stress Incontinence: associated with actions that increase intra-abdominal pressure such as coughing, sneezing, bending, lifting, or laughing. The cause is pelvic muscular weakness or urethral hypermobility.

3. Overflow Incontinence: occurs when the bladder muscle is overdistended. May present with stress or urge symptoms. The cause is an underactive bladder muscle, or a bladder outlet or urethral obstruction leading to overdistension and overflow.

4. Functional Incontinence: occurs when a physical or psychological impairment impedes continence status despite a competent urinary system.

F. Assessment: See included chart "Evaluating Incontinence"

G. Treatment Options

1. A stepped strategy moving from least to more invasive treatments should be used, with behavioral methods tried before medication, and both tried before surgery. [7]

2. Given the high prevalence of cognitive impairment in patients with incontinence, it is important to note that, according to Flint and Skelly, 55% of ambulatory patients became dry or had a significant improvement in incontinence with an individualized scheduled toileting program. [10]

3. See included chart "Treatment Options for Urinary Incontinence"

H. Case Analysis: Ms. B.

Ms. B is a 76-year-old widow. Her history is significant for diabetes mellitus, coronary artery disease, osteoarthritis and a past history of a total abdominal hysterectomy. She is a five days status post coronary artery bypass. Her postoperative course has been uneventful except for fluid retention as evidenced by pedal edema. Tomorrow she will be discharged to a cardiac short term rehabilitation center. Her baseline ambulatory status is a steady gait with a quad-cane.

Medications include:

ASA 81 mg PO OD
Metformin 500 mg PO BID with meals
Micronase 5 mg PO BID
Lasinopril 10 mg PO BID
Lasix 40 mg PO Q 12H
KCL 20meq PO Q 12H

You are reviewing her discharge instructions. Ms. B asks "Do you think I will still need these diapers when I get home? I never had problems holding my water before." Use your knowledge of incontinence in the elderly to formulate your response.

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* Mariano C, Gould E, Mezey M, Fulmer T, eds. Best Nursing Practices in Care for Older Adults: Incorporating Essential Gerontologic Content into Baccalaureate Nursing Education. 2nd ed. New York: The John A. Hartford Foundation Institute for Geriatric Nursing, Division of Nursing, School of Education, New York University; 1999

VI. Sleep Disorders

A. Demographics[7]

1. Up to 50% of older adults have some kind of sleep complaint, and up to 30% have chronic problems with sleep.

2. Up to half of older adults use some kind of sleeping medicine.

3. Rates of sleep disturbance s in long-term care settings are much higher

B. Normal Age-Related Sleep Changes

1. Aging is associated with decreased sleep continuity. Studies have shown that older individuals have less of a "sleep drive" and spend more time awake at night. Older people are also more sensitive to external factors such as noise, bright light or unfamiliar surroundings.

2. Many older people make up for lost nighttime sleep with daytime sleep. There is increased napping as people age.

3. The time required to fall asleep (sleep latency) increases with age

4. Older people average an increased number of arousals during sleep.

5. EEG changes: older age reduces the amplitude in the low frequency or NREM sleep. Older individuals appear to have less slow-wave sleep and seem to lose the deepest part of this sleep.

6. Circadian rhythm changes with age. The pineal gland secretion of melatonin diminishes with age. The result of this is less sleep at night and more during the day.

C. Sleep Disturbances:

1. Dyssomnias: disorders of initiating sleep, maintaining sleep and of excessive sleepiness.

2. Parasomnias: disorders that primarily do not cause sleep-related complaints.

3. Disorders associated with medical or psychiatric disorders.

4. Proposed sleep disorders: disorders that continue to be studied to become more well defined.

D. Causes

Common causes of sleep disorders may include periodic limb movements, restless legs syndrome, sleep-related breathing disorders such as apneas, illness, pain, nocturia, dementia and alcoholism. Depression is the most significant cause of insomnia.[1]

E. Assessment[1]

1. Sleep History: the impact of the sleep complaint on the individual's daily life.

2. Medical History: various medical conditions may contribute to sleep disturbances.

3. Diet and Drug History: include prescription and non-prescription medications as well as alcohol, caffeine, and nicotine.

4. Psychosocial History: should begin with psychiatric illnesses, such as anxiety, depression and dementia, and then assess social history including grieving the illness or loss of friends and family and translocation.

F. Treatment

1. Non-Pharmacologic Treatments

a. Remove the suspected contributing factors: treat the underlying illness, discontinue or change medication, discontinue alcohol, caffeine or nicotine use.

b. Change Habits: develop a sleep-preparation routine, use the bedroom for sleep only, develop a sleep story to promote a restful state of mind, reduce daytime napping, and develop a daily exercise routine.

2. Pharmacologic Treatment

a. Only recommended for short-term use in older patients.

b. Benzodiazepine with a short or intermediate action such as Temazepam (7.5 to 15 mg), with a two-week maximum time period in order to avoid dependence.

c. Antihistamines are acceptable for occasional use, but lose efficacy quickly

d. Sedating anti-depressants, e.g., Trazadone, are a good choice for chronic insomnia

3. Case Analysis: Ms. R.

Ms. R is a 79-year-old woman who lives with her husband in their own home. She is taking medication for hypertension, but has no other medical problems. She had one daughter who passed away five years ago with lung cancer. Three weeks ago, at her urging, Ms R's husband participated in a free prostate cancer screening at the local senior center and was diagnosed with the disease. He is scheduled for surgery next week.

Over the last several weeks, Ms. R has been seen at the Senior Center, falling asleep in the middle of the morning and again in the afternoon. Many of the seniors have commented that this is not the place to sleep and reported it to the director.

The nurse for the center made a visit one afternoon and interviewed Ms. R about her frequent napping at the center. On assessment, Ms. R stated that she had not been sleeping well at night. She stated that it took her about two hours to fall asleep and then she usually woke up about 2:00 AM and stayed up until 5:00 AM.

She finally manages to fall back to sleep for a few hours, before her husband awakens her at 6:30 AM for morning mass. She admitted that she told her physician and he prescribed her a "little purple pill" but she didn't want to take it. Further assessment revealed that Ms. R was very upset about her husband's impending surgery. She cried when she discussed the possibility of losing him and being alone in the world.

On review of the assessment, the nurse found no medical or pharmacological reason for Ms. R's insomnia. It appeared that her sleep disorder was most likely related to her anxiety over her husband's impending surgery. The nurse provided Ms. R with education about her husband's surgery. This helped Ms. R to gain some control over the future events. In addition, the nurse instructed Ms. R to avoid napping during the day and to add a program of physical exercise to her daily routine. Ms. R was assured that the low dose of Halcion prescribed for her was safe for a period of two weeks. The nurse requested the staff and other visitors of the senior center to take frequent opportunities to discuss her feelings of fear and loneliness and scheduled an appointment to come back and reassess Ms. R in two weeks.

When the nurse made her follow-up appointment, Ms. R revealed that her husband was home recovering well from the surgery. She no longer had problems sleeping and had discontinued the sleeping medication two days after her husband's return.

SOURCE: Mariano C, Gould E, Mezey M, Fulmer T, eds. Best Nursing Practices in Care for Older Adults: Incorporating Essential Gerontologic Content into Baccalaureate Nursing Education. 2nd ed. New York: The John A. Hartford Foundation Institute for Geriatric Nursing, Division of Nursing, School of Education, New York University; 1999, Topic 9, p8.

VII. Pressure Ulcers

A. Epidemiology [1, 11]

1. The prevalence varies widely as a function of care quality, venue, patient population, and the rigor with which pressure ulcers are identified.

2. Prevalence of pressure ulcers in acute care ranges from 3% to 32%, with an overall prevalence of 10%.

3. Prevalence in skilled care and nursing homes is estimated at approximately 23%.

4. Incidence among all elderly people at home is less than 1%; however, among those who receive nursing care in their homes, incidence is 4-5% , with prevalence 10-15%

B. Risk Assessment[7]

1. Extrinsic Risk Factors: pressure, friction, shear, chemical effects of moisture, urine, and stool.

2. Intrinsic Risk Factors: dermal thickness, subcutaneous adiposity, collagen tensile strength, and skin elasticity all decrease with aging; nutrition and hydration; conditions associated with immobility, impairment of sensation and reduced level of consciousness.

3. Assessment Tool (included): see the "Braden Scale for Predicting Pressure Sore Risk".

C. Pathophysiology [8]

1. There are four physical factors that can lead to the development of pressure ulcers:

   (a) Pressure – Mild pressure can produce ischemia in tissue after only two hours. This ischemia can then lead to tissue necrosis

   (b) Shear - A shearing force is produced where the skin is against a fixed exterior surface while the subcutaneous tissues are subjected to lateral forces

   (c) Friction – When the skin moves across another surface, abrasions can occur and cause burns

   (d) Moisture – Moisture can lead to tissue maceration. If urinary or fecal incontinence is present, this can add a chemical irritant

D. Prevention (The National Pressure Ulcer Advisory Panel's Summary of the AHCPR Clinical Practice Guideline, Pressure Ulcers in Adults: Prediction and Prevention)[12]

1. Risk Assessment (see above)

2. Skin Care and Early Treatment

a. Inspect the skin at least daily and document assessment results.
b. Individualize bathing frequency, use a mild cleansing agent, avoid hot water and excessive friction.
c. Assess and treat incontinence.
d. Use moisturizers for dry skin; minimize environmental factors leading to dry skin.
e. Avoid massage over bony prominences.
f. Use proper positioning, transferring and turning techniques to minimize skin injury.
g. Use dry lubricants (cornstarch) or protective coverings to reduce friction injury.
h. Identify and correct factors compromising protein / calorie intake and consider nutritional supplement / support for nutritionally-compromised persons.
i. Institute a rehabilitation program to maintain or improve mobility / activity status.
j. Monitor and document interventions and outcomes.

3. Mechanical Loading and Support Surfaces
   a. Reposition bed-bound persons at least every 2 hours, chair-bound persons every hour.
   b. Use a written repositioning schedule.
   c. Place at-risk persons on a pressure-reducing mattress/chair cushion. Do no use donut-type devices.
   d. Consider postural alignment, distribution of weight, balance and stability, and pressure relief when positioning persons in chairs or wheelchairs.
   e. Teach chair-bound persons, who are able, to shift weight every 15 minutes.
   f. Use lifting devices to move rather than drag persons during transfers and position changes.
   g. Use pillows or foam wedges to keep bony prominences such as knees and ankles from direct contact with each other.
   h. Use devices that totally relieve pressure on the heels
   i. Avoid positioning directly on the trochanter when using the side-lying position.
   j. Elevate the head of the bed as little and for as short a time as possible.

4. Education

   a. Implement educational programs for the prevention of pressure ulcers.

b. Include information on etiology and risk factors, risk assessment tools, skin assessment, support surfaces, skin care, positioning, and documentation.

E. Staging Definitions (National Pressure Ulcer Advisory Panel NPUAP)

1. Stage I: A stage I pressure ulcer is an observable pressure-related alteration of intact skin whose indicators, as compared to an adjacent or opposite area on the body, may include changes in one or more of the following: skin temperature (warmth or coolness); tissue consistency (firm or boggy feel); sensation (pain, itching); and color. Specifically, the ulcer appears as a defined area of persistent redness in a lightly pigmented skin, whereas in darker skin tones, the ulcer may appear with persistent red, blue, or purple hues.

2. Stage II: Partial thickness skin loss involving epidermis and / or dermis. The ulcer is superficial and presents clinically as an abrasion, blister, or shallow crater.

3. Stage III: Full-thickness skin loss involving damage or necrosis of subcutaneous tissue that may extend down to, but not through, underlying fascia. The ulcer presents clinically as a deep crater with or without undermining of adjacent tissue.

4. Stage IV: Full-thickness skin loss with extensive destruction, tissue necrosis or damage to muscle, bone or supporting structures (e.g., tendon, joint capsules, etc.)

F. Treatment[1]

1. Assess the whole person, not just the pressure ulcer, including physical health, pain, psychosocial health, and pressure ulcer complications.

2. Attempt to use established measures of wound healing (PUSH) (NPUAP, 1997).

3. Maintain principles of wound care relevant to pressure ulcers:

a. Debride wound
b. Clean wound
c. Use solutions that DON'T kill cells; DON'T use solutions that are cytotoxic i.e. hydrogen peroxide, Dahen's Solution, or Betadine
d. Irrigate wound, using minimal force
e. Cover wound with appropriate dressing

VIII. References:

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[17]Schue, R.M., Langemo, D.K. (1999) Prevalence, Incidence, and Prediction of Pressure Ulcers on a Rehabilitation Unit. Fargo: Restorative Care, Veterans Administration Hospital.

[18] AHCPR Publication No. 92-0047. Rockville, Maryland. May 1992.

IX. Learning Resources:

A. Suggested Reading:

Tinetti, M. E., Baker, D. I., McAvay, G., Claus, E. B., Garrett, P, et al. 1994. A Multifactorial Intervention to Reduce the Risk of Falling among Elderly People Living in the Community. New England Journal of Medicine, 331(1), pp. 821-827.

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B. Tables:

TABLE 1: The Ability of "Up & Go" Time Scores to Reflect Basic Mobility Skills[6]

		Timed "Up & Go" (Sec)		
		10-19 n = 17	20-29 n= 15	30+ n= 26
		%	%	%
Chair Transfers	Self	100	93	62
	Needs Help	0	7	35
	Can't Do	0	0	3
Toilet Transfers	Self	100	87	73
	Needs Help	0	13	27
	Can't Do	0	0	0
Walking Aid	None	41	6	0
	Cane	47	75	48
	Walker	6	0	41
	Supervision	6	19	11

TABLE 2: THE ABILITY OF "UP & GO" TIME SCORES TO REFLECT EXTENDED MOBILITY SKILLS [6]

		Timed "Up & Go" (Sec)		
		10-19 n = 17	20-29 n= 15	30+ n= 26
		%	%	%
Tub or shower transfers	Self	59	60	23
	Needs Help	41	40	77
	Can't Do	0	0	0
Walk 50 Yards	Self	82	67	15
	Needs Help	18	33	50
	Can't Do	0	0	35

Climbs stairs	Self	77	60	4
	Needs Help	23	40	81
	Can't Do	0	0	15
Goes outside alone	Yes	76	25	0
	Yes, not safe	6	25	15
	Needs Help	18	50	85

TABLE 3. TREATMENT OF IDENTIFIED RISK FACTORS FOR FALL INJURY [3A]

Risk Factor	Medical/Specialty-Intervention	Other Disciplines-Intervention
Balance and gait problems due to neurological disease	Diagnosis and treatment of specific diseases, with neurologic consultation if needed	PT: Balance and gait training; assessment for walking aid OT, N: Environmental safety assessment, especially lighting, adaptive devices
Musculoskeletal problems Upper or lower extremity weakness, arthritis, deformity	Diagnosis and treatment of specific diseases—orthopedic or rheumatology consultation if needed	OT, PT: Balance and gait training; muscle strengthening exercises; assessment for walking aid
Foot Problems	Foot Care (nails, bunions, calluses); podiatric or orthopedic consultation if needed	OT, N: Environmental safety assessment; adaptive devices (e.g. raised toilet seats, grab bars in tub); appropriate shoes
Cognitive Impairment	Evaluation for treatable disease; avoidance of sedating or centrally acting drugs	OT, N, S: Environmental safety assessment, including need for supervision; supervised exercise
Poor Vision	Ophthalmologic examination; Corrective lenses; surgery	OT, PT: Low vision aids; balance and gait Training
Osteoporosis	Calcium, vitamin D, medication	PT: weight-bearing

	to decrease bone loss	exercise; use of hip padding; balance and gait training OT, N: Environmental safety assessment, especially floor surfaces
Low body mass index	Medical evaluation for occult disease; depression. Dietary consultation, nutritional supplements	
Medications	Eliminate unnecessary medications; use lowest effective dose; select shorter-acting agents	

C. Assessment Tools:

1. Tinetti Balance and Gait Evaluation*

BALANCE
Instructions: Seat the subject in a hard armless chair. Test the following maneuvers. Select one number that best describes the subject's performance in each text, and add up the scores at the end.

1. Sitting balance
   Leans or slides in chair = 0
   Steady, safe = 1 _____

2. Arising
   Unstable without help = 0
   Able but uses arms to help = 1
   Able without use of arms = 2 _____

3. Attempt to arise
   Unable without help = 0
   Able but requires more than one attempt = 1
   Able to arise with one attempt = 2 _____

4. Immediate standing balance (first 5 seconds)
   Unsteady (staggers, moves fee, marked trunk sway) = 0
   Steady but uses walker or cane or grabs other objects for support = 1
   Steady without walker, cane, or other support = 2 _____

5. Standing balance
   Unsteady = 0
   Steady but wide stance (medial heels more than 4 inches apart) or uses cane, = 1
   walker, or other support

Narrow stance without support = 2 _____

6. Nudging (with subject's feet as close together as possible, push lightly on the sternum with palm of hand three times)
   Begins to fall = 0
   Staggers and grabs, but catches self = 1
   Steady = 2 _____

7. Eyes closed (at same position as in No. 6)
   Unsteady = 0
   Steady = 1 _____

8. Turning 360 degrees
   Discontinuous steps = 0
   Continuous steps = 1 _____
   Unsteady (grabs and staggers) = 0
   Steady = 1 _____

9. Sitting down
   Unsafe (misjudges distance, falls into chair) = 0
   Uses arms or lacks smooth motion = 1
   Safe, smooth motion = 2 _____

GAIT
Instructions: The subject stands with the examiner, and then walks down the hallway or across the room, first at the usual pace and then back at a rapid but safe pace, using a cane or walker if accustomed to one.

10. Initiation of gait (immediately after being told to go)
    Any hesitancy or several attempts to start = 0
    No hesitancy = 1 _____

11. Step length and height
    Right swing foot:
      Fails to pass left stance foot with step = 0
      Passes left stance foot = 1 _____
      Fails to clear floor completely with step = 0
      Completely clears floor = 1 _____
    Left swing foot:
      Fails to pass right stance foot with step = 0
      Passes right stance foot = 1 _____
      Fails to clear floor completely with step = 0
      Completely clears floor = 1 _____

12. Step symmetry
    Right and left step length unequal = 0
    Right and left step equal = 1 _____

13. Step continuity
    Stopping or discontinuity between steps = 0
    Steps appear continuous = 1 _____

14. Path (observe excursion of either left or right foot over about 10 feet of the course)

Marked deviation = 0
Mild to moderate deviation or uses walking aid = 1
Walks straight without aid = 2 _____

15. Trunk
Marked sway or uses walking aid = 0
No sway but flexion of knees or back or spreads arms out while walking = 1
No sway, flexion, use of arms, or use of walking aid = 2 _____

16. Walking stance
Heels apart = 0
Heels almost touching while walking = 1 _____

Balance score _____ / 16 Gait score: _____ / 12

Total score: _____ / 28

[*] Modified from M Tinetti, Performance-Oriented Assessment of Mobility Problems in Elderly Patients, *Journal of the American Geriatric Society*, Vol. 34, pp. 119-126, 1986, Lippincott Williams & Wilkins.

2. Gait Disorders Classified by Sensorimotor Level[*]

Sensorimotor Level	Condition (pathology, symptoms, signs)	Typical Gait Findings
Low		
Peripheral sensory	Sensory ataxia (posterior column, peripheral nerves)	Unsteady uncoordinated
	Vestibular ataxia	Unsteady, weaving ("drunken")
	Visual ataxia	Tentative, uncertain
Peripheral motor	Arthritic (antalgic, joint deformity)	Avoids weight bearing on affected side, shortened stance phase Painful hip may produce Trendelenburg's sign (trunk shift over affected side) Painful knee is flexed Painful spine produces short, slow steps and decreased lumbar lordosis Other non-antalgic features: contractures, deformity-limited motion, buckling with weight bearing Kyphosis and ankylosing spondylosis produce stooped posture Unequal leg length can produce trunk and pelvic motion abnormalities (including Trendelenburg's sign)
	Myopathic and Neuropathic (weakness)	Pelvic girdle weakness produces exaggerated lumbar lordosis and lateral trunk flexion (Trendelenburg's sign and waddling gait) Proximal motor neuropathy produces waddling gait and foot slap Distal motor neuropathy produces distal weakness (especially ankle dorsiflexion or foot drop), which may lead to exaggerated hip flexion or foot lifting (steppage gait) and foot slap
Middle		

Spasticity	Hemiplegia, hemiparesis	Leg swings outward and in semi-circle from hip (circumduction); knee may hyperextend (genu recurvatum), and ankle may excessively plantar flex and invert (talipes equinovarus); with less paresis, some may only lose arm swing and only drag or scrape foot
	Paraplegia, paraparesis	Both legs circumduct, steps are short shuffling and scraping, and when severe, hip adducts so that knees cross in front of each other (scissoring)
Parkinsonism		Small shuffling steps, hesitation, acceleration (festination), falling forward (propulsion), falling backward (retropulsion), moving the whole body while turning (turning en bloc), absent arm swing
Cerebellar ataxia		Wide-based with increased trunk sway, irregular stepping, especially on turns
High		
Cautious gait		Fear of falling with appropriate postural responses, normal to widened base, shortened stride, decreased velocity, and en bloc turns
Frontal-related	Cerebrovascular, normal-pressure hydrocephalus	Proposed spectrum ranges from gait ignition failure to frontal gait disorder to frontal disequilibrium; may also have cognitive, pyramidal, and urinary disturbances Gait ignition failure: difficulty initiating gait, short shuffling gait, may freeze with diversion of attention or turning Frontal gait disorder: similar to Parkinson's disease Frontal disequilibrium: cannot stand unsupported

[*] Alexander NB. Differential diagnosis of gait disorders in older adults. *Clin Geriatr Med.* 1996;12(4):697-698. Reprinted with permission.

3. Evaluating Incontinence

Components	**Comments**
History	
Provider initiation	50% of affected persons do not report UI; many assume UI is normal
Specific symptoms	Diagnostic value varies with symptom definition, age and gender, underlying pathology Precipitant urgency suggests DO; precipitants include running water, handwashing, cold temperatures, sight of garage or front door
	UI with coughing, laughing, bending, etc.; sensitive for stress UI; delay between maneuver and UI or urge before leakage suggests stress-induced urge UI; leakage with minimal maneuvers or continual urine dripping suggests ISD
	Frequency, nocturnia, slow urine stream, hesitancy, interrupted voiding, straining, and terminal dribbling are common with DO, DHIC, BOO, detrusor underactivity, many medical conditions
	Voiding symptom scores (eg, AUA BPH symptom score) useful as severity measure but lack specificity, are not diagnostic
UI characteristics	Onset, frequency, volume, timing, and precipitants (eg, medications, caffeine, alcohol, physical activity, cough)
Associated factors	Medical conditions and medications with temporal relation to UI
Quality of life	Inquire how patient and caregiver are affected, ie, activities of daily living, social, emotional, interpersonal (eg, sexual) relations, self-concept, and general health perception; most bothersome aspect
Physical examination	
General	Orthostatic vital signs, alertness, cognition, functional status

Cardiovascular	Volume overload, peripheral edema
Abdomen, rectal	Bladder by palpation (insensitive); rectal masses and impaction
Back	Dimpling or hair tuft at spine base suggests incomplete spina bifida
Musculoskeletal	Mobility and manual dexterity
Neurologic	Cervical disease suggested by limited lateral rotation and lateral flexion, interossei wasting, and Hoffman's or Babinski's sign
	Sacral root integrity: perineal sensation; anal sphincter tone; anal "wink" and bulbocavernosus reflex
Genitourinary	Men: prostate exam; if uncircumcised, check for phimosis, paraphimosis, and balanitis
	Women: vaginal mucosa for atrophy and pelvic support
Testing	
Voiding record	48-hour record establishes baseline severity; timing and circumstances of UI and continent voids; voided volume; voiding frequency; total day and nocturnal urine output **; UI-associated activities (eg, coffee drinking, exercise). In institutions, staff record patient continence status (dry, damp, soaked) q2h. If nocturnal diuresis, causes (eg, pedal edema, CHF, or alcohol "nightcap") should be sought; UI occurrence at a typical time of day suggests association with medication, beverages or activity
Clinical stress test	Best if bladder full, patient relaxes perineum, and single vigorous cough used; specific for stress UI if leakage instantaneous with cough; insensitive if patient cannot cooperate, is inhibited, or if bladder volume low; several-second delay before UI suggests stress-induced DO
Urine flow rate	Peak flow ∃ 12 mL/sec for voided volume ∃ 200 mL useful for excluding BOO; low flow rate not specific
Postvoiding residual	Done by catheterization or ultrasound; repeated measures possibly needed; PVR , 50 mL can contribute to frequency or nocturia, exacerbate urge and stress UI; PVR , 200 mL suggests detrusor weakness or BOO, and in men hydronephrosis should be excluded (rare in older women)
Laboratory tests	Renal function; glucose, calcium, vitamin B_{12} levels, urinalysis and culture; urine cytology and cystoscopy if hematuria or pelvic pain present; PSA in men, if cancer screening appropriate or desirable

** Example: if nocturnal output (volume voided during hours of sleep, plus first morning void) = 800 mL and modal volume voided (proxy for functional bladder volume) = 200 mL, then patient must void 3-4 times / night (800 / 200 = 4).
NOTE: AUA = American Urological Association; BOO = bladder outlet obstruction; BPH = benign prostatic hyperplasia; CHF = congestive heart failure; DHIC = detrusor hyperactivity with impaired contractility; DO = detrusor overactivity; ISD = intrinsic sphincter deficiency; PSA = prostate specific antigen; PVR = postvoiding residual volume; UI = urinary incontinence

SOURCE: Cobbs EL, Duthie EH, Murphy JB, eds. Geriatrics Review Syllabus: A Core Curriculum in Geriatric Medicine. 4th ed. Dubuque, Iowa: Kendall/Hunt Publishing Company for the American Geriatrics Society; 1999. p119.

4. Braden Scale for Predicting Pressure Sore Risk*

Patient's Name_____ Evaluator's Name_____ Date of Assessment_____

Article I. SENSORY PERCEPTION ability to respond meaningfully to pressure-related discomfort	**1. Completely Limited:** Unresponsive (does not moan, flinch, or grasp) the painful stimuli because of diminished level of consciousness or sedation. OR limited ability to feel pain over most of body surface.	**2. Very Limited:** Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness. OR has a sensory impairment that limits the ability to feel pain or discomfort over ½ of the body.	**3. Slightly Limited:** Responds to verbal commands, but cannot always communicate discomfort or need to be turned. OR has some sensory impairment that limits ability to feel pain or discomfort in 1 or 2 extremities.	**4. No Impairment** Responds to verbal commands. Has no sensory deficit that would limit ability to feel or voice pain or discomfort.
Article II. MOISTURE degree to which skin is exposed to moisture	**1. Constantly Moist:** Skin is kept moist almost con-stantly by perspiration, urine, etc. dampness is detected every time patient is moved or turned.	**2. Very Moist:** Skin is often, but not always moist. Linen must be changed at least once a shift.	**3. Occasionally Moist:** Skin is occasionally moist, requiring an extra linen change approximately once a day.	**4. Rarely Moist:** Skin is usually dry, linen only requires changing at routine intervals.
Article III. **ACTIVITY** degree of physical activity	**1. Bedfast:** Confined to bed	**2. Chairfast:** Ability to walk severely limited or nonexistent. Cannot bear own weight and / or must be assisted into chair or wheelchair.	**3. Walks Occasionally:** Walks occasionally during day, but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.	**4. Walks Frequently:** Walks outside the room at least twice a day and inside room at least once every 2 hours during waking hours.
Article IV. MOBILITY ability to change and control body position	**1. Completely Immobile:** Does not make even slight changes in body or extremity position without assistance.	**2. Very Limited:** Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.	**3. Slightly Limited:** Makes frequent though slight changes in body or extremity position independently.	**4. No Limitation:** Makes major and frequent changes in position without assistance.
Article V. NUTRITION *usual* food intake	**1. Very Poor:** Never eats a complete meal. Rarely eats more then 1/3 of any food offered. Eats 2 servings or less protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement. OR is NOP and / or maintained on clear liquids or IVs for more than 5 days.	**2. Probably Inadequate:** Rarely eats a complete meal and generally eats only about ½ of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Ocassion-ally will take a dietary supplement. OR receives less than optimum amount of liquid diet or tube feeding.	**3. Adequate:** Eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy products) each day. Occasionally will refuse a meal, but will usually take a supplement if offered.	**4. Excellent:** Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.
Article VI. FRICTION AND SHEAR	**1. Problem:** Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spas-ticity, contractures, or agitation leads to almost constant friction.	**2. Potential Problem:** Moves feebly or requires minimum assistance. During a move skin probably slides to some extent against against sheets, chair, restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.	**3. No Apparent Problem:** Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.	

Barbara Braden and Nancy Bergstrom. Copyright, 1988. NOTE: NPO = Nothing by mouth; IV = Intravenously; TPN = Total parenteral nutrition

Remove these END Notes

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